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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,295	09/30/2003	Andrea Urban	10191/3212A	8189

26646 7590 09/12/2008

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EXAMINER	
AHMED, SHAMIM	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
09/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/676,295	URBAN ET AL.	
	Examiner	Art Unit	
	Shamim Ahmed	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-8 and 10-21 have been considered but are moot in view of the new ground(s) of rejection.

*Rema*rks

2. The rejections of dated 5/23/05 based on Laermer et al (USP 6,720,268) is reinstate below as the petition under 37 CFR 1.78(a)(3), filed November 25,2005 is dismissed (see petition decision dated 6/23/08).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-8, 10 and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Laermer et al (6,720,268).

> The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Laermer et al disclose a plasma etching of a silicon body to form trench, wherein injecting a high-frequency AC voltage modulated by additional low-frequency modulated voltage time to time, wherein the high-frequency is injecting into the

substrate to be etched such as silicon body (18) via a substrate electrode (12) (col.3, lines 36-48, col.4, lines 39-46, col.10, lines 39-56).

Laermer et al also disclose that the modulation of the high frequency pulses comprises short and long pauses between the pulses and the low frequency of 50 Hz to 10 kHz and the high frequency generator can be periodically switched off and on (pulsed) (col.10, lines 47-52) and aforementioned reads on the limitation of refraining the high frequency power into the etching body in response to the presence of ambipolar plasma (col.11, lines 7-31).

As to the ambipolar plasma, it would have been obvious to include the plasma an ambipolar status because plasma is nothing but excited or reactive species (atoms, radicals and ions, which could be in ambipolar in nature.

As to claim 19-20, Laermer teach that under etching is performed in relatively mild condition than that of etching to form the trench by increasing the density of fluorine radicals (col.7, lines 28-65).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laermer et al (6,720,268) in view of Koshimizu (5,290,383).

Laermer et al discusses above in the paragraph 4 but fail to teach adding an inert gas in the plasma.

However, in a controlled plasma etching process of silicon substrate, Koshimizu teaches the addition of inert gas into the plasma in order to stabilize the plasma (col.14, lines 29-41).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Koshimizu's teaching into Laermer et al's process for stabilizing the plasma as taught by Koshimizu.

8. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laermer et al (6,720,268) in view of Hashimoto et al (5,779,925).

Laermer et al discusses above in the paragraph 4 but fail to teach synchronizing the modulation and the low-frequency modulation with one another.

However, Hashimoto et al teach that the RF bias is synchronized with the on/off modulation in order to reduce charging damage with out lowering the through put (col.16, lines 35-42, lines 66-col.17, and line 5).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Hashimoto et al's teaching into Laermer et al's process for reducing charging damage and for improved etching precision as taught by Hashimoto et al.

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laermer et al (6,720,268) in view of Dockrey (4,799,991).

Laermer et al discusses above in the paragraph 4 and also teach that the under etching can be performed using NF_3 (col.11, lines 56-59) but fail to teach that the under etching is performed using highly oxidizing fluorine compound includes ClF_3.

However, in a process of silicon etching, Dockrey teaches both the NF_3 and ClF_3 can be used as an efficient etchant for silicon (see claims 7 and 12).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Dockrey's teaching into Laermer et al's process because both NF_3 and ClF_3 are functionally equivalent as taught by Dockrey.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-

1457. The examiner can normally be reached on Tu-Fri (12:30-10:30) Every Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shamim Ahmed/
Primary Examiner, Art Unit 1792

SA
September 10, 2008